

Amendments to the Specification

The following amendments to the specification are identified with respect to paragraph numbers of the application as published on Nov15.2007, Pub. No. US 2007/0261455. These amendments comply with the examiner's instructions, correct errors in figure reference numerals, and import into the specification disclosures made in the original figures. No new matter is added by these amendments.

Specification amendment #1. Replace the original title with the following new title as indicated. Amendment of the title is made in order to more accurately indicate the subject matter of the amended claims.

— ~~Method for Manufacturing a Circular Metal Tank~~ TANK WALL AND METHOD AND SYSTEM FOR MAKING —

Specification amendment #2. Substitute paragraph [0050] with the following amended paragraph [0050]. This amendment is made in response to the examiner's new subject matter objection to a prior amendment.

— [0050] **FIG. 3a** illustrates a bender/corrugator **40** which creates a first "L" bend **42** along the upper longitudinal edge **36** and a second "chair" bend **44** along the lower longitudinal edge **38** of the metal sheet **30**. In the preferred embodiment of the invention the first bend **42** forms what will be termed in the document an L-shaped bend with an angle of between 45 and 135 degrees with the metal sheet **30** and has a width of between 5 and 100mm, (depending on the thickness of the metal, the type of metal, and the size of the tank 10). In the preferred embodiment the second bend **44** has a horizontal portion **46** that is between 5mm and 100mm wide and a vertical portion **48** that is between 5mm and 150mm. In this document the term "chair bend shall mean a structure that has two parallel, elongated sheets of metal extending out of either side joined by a cross member with the angle between either sheet and the cross member

being at least 45 degrees."

Specification amendment #3. Substitute paragraph [0057] with the following amended paragraph [0057]. This amendment is made in order to correct the misuse of two reference numerals with respect to FIG 5b, which does not have numerals 118 or 119.

— [0057] FIG. **5b**, shows double roller **110** in isolation. The double roller **110** may be used alone or as part of a welding pre-aligner **50**. The double rollers are also used at other points during the construction of the tank **10**, as shown in Figs. **1** and **2**. Generally, the double rollers **110** may be motorized or free-rolling. In the preferred embodiment of the present invention the double rollers **110** of the welding pre-aligner **50** and the double rollers **111** of the welding positioner **60** are motorized to aid in the accurate positioning and welding of the metal sheet **30**. In addition, in the embodiment in FIG. **5b**, the double roller **110** has rollers **448 115** and **449 117** that are adjustable. Rollers **448 115** and **449 117** can be simultaneously horizontally adjusted while the upper roller **448 115** can also be vertically adjusted upwards or downwards. —

Specification amendment #4. Substitute paragraph [0058] with the following amended paragraph [0058]. This amendment is made in order to set forth in the written description matter originally disclosed in the figures, as further discussed below.

— [0058] FIGs **6a** and **6b** illustrate the roller track **160** formed by an adjacent "L" bend **42** and chair bend **44** of the unwelded upper and lower edges **36, 38** of metal sheet **30**. As shown in these figures, the roller track **160** has two opposing roller track sides. The first roller track side is formed by metal sheet **30** and the second roller track side is formed by an opposing vertical portion **48** of the chair bend **44**. As shown in Figures **11a** and **11b** and as discussed below, the space between the roller track sides accommodates one or more rollers that engage the

roller track. By engaging the roller track these rollers support and rotate the tank wall as it is being constructed. In the preferred embodiment of the invention the first bend **42** forms an angle of between 45 and 135 degrees with the metal sheet **30** and has a width of between 5 and 100mm, (depending on the thickness of the metal, the type of metal, and the size of the tank **10**). In the preferred embodiment the second bend **44** has a horizontal portion **46** that is between 5mm and 100mm wide and a vertical portion **48** that is between 5mm and 150mm. —

Specification amendment #5. Substitute paragraph [0065] with the following amended paragraph [0065]. This amendment is made in order to set forth in the written description matter originally disclosed in the figures, as further discussed below.

— [0065] FIGs. **11a** and **11b** illustrate a welded roller track **160** engaged by a single roller **100**. Single rollers **100** are used throughout the support system **80** (see FIG. **1**) to support the tank **10** while allowing it to be easily rotated as the metal sheet **30** is welded and advanced in a helical fashion to produce the tank wall. As seen in the figures, the roller **100** is received between the roller track sides. Referring again to FIGs **1a**, **1b** and **1c**, the support system **80** may comprise as many or as few single rollers **100** and double rollers **110** & **111** as are deemed necessary depending on the height and size of the tank **10**, and the size and thickness of the metal sheet **30**. —

Specification amendment #6. Immediately after paragraph [0069], add the following section heading and new paragraphs [0070] to [0096]. This amendment is made in order insure that the disclosures of the original claims are incorporated into and preserved by the present specification.

— Summary

[0070] The invention disclosed herein may be conveniently summarized, at

least in part, with reference to the following enumerated statements:

[0071] Statement 1. The invention includes a method for manufacturing a circular metal tank, comprising the steps of: providing an elongated sheet of metal; bending said sheet of metal along an upper longitudinal edge thereof to produce a first bend; bending said sheet of metal along a lower longitudinal edge thereof to produce a second bend; moving said sheet of metal in a helical trajectory such that said second bend comes into proximity above said first bend; welding said second bend to said first bend to form a wall of said tank, said wall having a continuous, helical weld; wherein said first and second bends cooperate to form a helical roller track on an outside of said tank; and wherein said tank is supported on a plurality of rollers that engage said roller track; and wherein said tank is rotated about its longitudinal axis on said rollers such that said tank moves upwards as said sheet of metal is welded to a bottom thereof.

[0072] Statement 2. The invention includes the method of Statement 1 wherein said elongated sheet of metal is a coiled sheet of metal which is decoiled prior to said bending steps.

[0073] Statement 3. The invention includes the method of Statement 1 wherein said first bend is an "L"-bend and said second bend is a chair-bend.

[0074] Statement 4. The invention includes the method of Statement 1 wherein said metal sheet is corrugated before said welding step.

[0075] Statement 5. The invention includes the method of Statement 1 wherein prior to said welding step adjacent portions of said first and second bends are gross positioned and then fine positioned.

[0076] Statement 6. The invention includes the method of Statement 1

wherein at least one of said rollers is motorized and said tank and said metal sheet are moved by means of said motorized roller.

[0077] Statement 7. The invention includes the method of Statement 1 wherein said metal sheet is made of one of aluminum, galvanized steel, stainless steel, carbon steel.

[0078] Statement 8. The invention includes the method of Statement 1 wherein said first bend forms an angle of between 45 and 135 degrees with a body of said metal sheet.

[0079] Statement 9. The invention includes the method of Statement 1 wherein said first bend has a width of 5 mm to 100 mm.

[0080] Statement 10. The invention includes the method of Statement 1 wherein a width of a horizontal portion of said second bend is between 5mm to 100 mm.

[0081] Statement 11. The invention includes the method of Statement 1 wherein a width of a vertical portion of said second bend is between 5mm to 150 mm.

[0082] Statement 12. The invention includes the method of Statement 1 wherein a top of said tank is cut so as to create an upper circumferential edge which is parallel to the ground.

[0083] Statement 13. The invention includes the method of Statement 1 wherein a bottom of the tank is cut during operation to create a lower circumferential edge which is parallel to the ground.

[0084] Statement 14. The invention includes a system for manufacturing a circular metal tank, wherein the system comprises a decoiler for decoiling a coiled sheet of metal; a bender/corrugator for introducing a first bend along an upper longitudinal edge of said metal sheet and a second bend along a second longitudinal edge of said metal sheet; a support system having rollers for moving said metal sheet along a helical trajectory, supporting said tank and for rotating said tank about its longitudinal axis as said metal sheet is added to a bottom edge of said tank; a welding positioner for positioning said second bend proximate and above said first bend; a welder for welding said first and second bends together to form a circular wall of said tank; wherein said first and second bends cooperate to form a helical roller track on an outside of said tank; and wherein said tank is supported on said rollers that engage said roller track.

[0085] Statement 15. The invention includes the system of Statement 14 further comprising a vertical coil seam welder for butt-welding an end of a first coiled metal sheet to an end of a second coiled metal sheet before said metal sheet pass through said bender/corrugator.

[0086] Statement 16. The invention includes the system of Statement 14 further comprising a welding pre-aligner for gross positioning said first and second bends before said first and second bends are positioned by said welding positioner.

[0087] Statement 17. The invention includes the system of Statement 14 wherein said first bend is an "L"-bend and said second bend is a chair-bend.

[0088] Statement 18. The invention includes the system of Statement 14 wherein said bender/corrugator additionally corrugates said metal sheet.

[0089] Statement 19. The invention includes the system of Statement 14 wherein at least one of said rollers is motorized and said tank and said metal sheet are moved by means of said motorized roller.

[0090] Statement 20. The invention includes the system of Statement 14 wherein said metal sheet is made of one of aluminum, galvanized steel, stainless steel, carbon steel.

[0091] Statement 21. The invention includes the system of Statement 14 wherein said first bend forms an angle of between 45 and 135 degrees with a body of said metal sheet.

[0092] Statement 22. The invention includes the system of Statement 14 wherein said first bend has a width of 5 mm to 100 mm.

[0093] Statement 23. The invention includes the system of Statement 14 wherein a width of a horizontal portion of said second bend is between 5mm to 100 mm.

[0094] Statement 24. The invention includes the system of Statement 14 wherein a width of a vertical portion of said second bend is between 5mm to 150 mm.

[0095] Statement 25. The invention includes the system of Statement 14 further comprising means for cutting a top of said tank so as to create an upper circumferential edge which is parallel to the ground.

[0096] Statement 26. The invention includes the system of Statement 14 further comprising means for cutting a bottom of the tank to create a lower circumferential edge which is parallel to the ground. —